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THE GOLDEN-EYE OR LACE-WING FLY.¹

BY CLARENCE MOORES WEED.

Throughout the summer there may commonly be found upon the leaves of a great variety of plants, especially those infested by aphides of plant lice, groups of peculiar little vertical stalks tipped with small, oval, whitish bodies (Fig. 1 *a*). Should you be able to watch one of these groups for some time you would be likely to see a curious little larva hatch from each of the eggs—though the time of hatching is likely to vary, some emerging from the eggs considerably before the others.

The larvæ that have thus been cradled in the air are called aphis-lions, from their habit of feeding upon aphides. Soon after hatching they wander over the plant in search of prey, for which purpose almost any small insect will serve, but aphides generally form the principal item in the daily bill of fare. The aphis-lion has a formidable pair of jaws projecting forward from the head, so constructed that each jaw is a hollow sucking tube as well as an organ for seizing and piercing the victim.

Like other larvæ the aphis-lions cast their skins occasionally as they increase in size. They become fully developed after a few weeks, and are then nearly an inch long, and of the form shown in *b* and *d* of the figure. The different species vary considerably in color, but most are of more or less mottled shades of blue, brown, black and white. The presence of the sucking-tube in the jaw is explained when one examines the insect under the microscope, and finds that the mandible or jaw proper is grooved longitudinally on its inner surface, while the maxilla or secondary jaw is grooved longitudinally on its outer surface: these fit together so that the grooves form a tube, through which the juices of the victims may be sucked into the stomach.

The fully developed larva prepares for the change to the pupa by rolling itself together compactly, and then spinning

¹ From *Stories of Insect Life*, Grim & Co., 1897.

from the posterior end of its body a spherical silken cocoon, so small that one can but wonder how so large a larva stays inside it. The completed cocoon (c) is about the size of a small

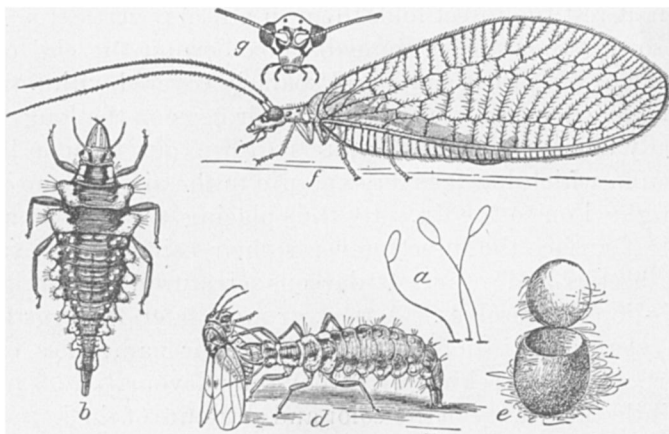


FIG. 1. *Chrysopa oculata*. a, eggs; b, full-grown larva or aphid-lion; d, larva devouring an adult psylla; e, cocoon; f, adult insect; g, front view of the head of the adult—all enlarged. (Reduced from figure by U. S. Dept. of Agr.)

smooth pea, of a pearly white color, generally mottled in places with black (e). Within this tiny ball the larva becomes a pupa, and a short time afterwards changes into an adult, which gnaws out a circular cap and escapes.

The adult is a very different insect from the larva. It is a delicate-looking creature, a little over half an inch long, of a pale green or bluish-green color, with beautiful golden eyes standing out prominently on the sides of the head, which bears too long slender feelers or antennæ, that under a lens are seen to be furnished with numerous fine hairs. The first segment behind the head—called the prothorax—is wide and flattened; it bears a single pair of legs. The two following segments—the mesothorax and metathorax—are much larger and closely united; each bears a pair of wings above and a pair of legs below. The legs are rather long and slender, of much the same color as the body; the feet are tipped with two recurved claws. The wings are very large in proportion to the

body ; they consist of a thin, transparent membrane, stretched between a beautiful net-work of delicate greenish veins, which bear rows of brownish hairs. The front and hind wings are quite similar in shape, the hind ones being somewhat smaller ; when at rest the insect folds them in a nearly vertical position (*f*), so that they project some distance beyond the end of the abdomen, which is slender and sparsely covered with hairs.

The female Lace-wings deposit their eggs on the long stalks already mentioned. The stalk is drawn out from a liquid secretion which hardens on exposure to the air, and the egg is then glued on to the tip. By thus placing the eggs up above the leaf surface the insect prevents their being eaten by lady bird beetles and other predaceous creatures, including the aphid-lions themselves. A week or more later the eggs hatch into young aphid-lions, which, like their namesakes of the desert, go about seeking what they may devour.

While the beauty of the color and structure of the Lace-wing appeals strongly to the eye of the nature-lover, the insect has a very different effect upon his nose ; for these delicate creatures emit probably the most disagreeable odor of any insects. It is worse, to many minds at least, than that given off by the bedbug and its allies, or even the noisome pestilence of the carrion-beetles. How so small an insect, reared from infancy upon a cleanly diet of the juices of just-killed animals, spending its resting period in a "glistening, white cocoon, which looks like a large seed-pearl," and deriving nourishment as an adult from cleanly sources, can develop so disagreeable a stench is indeed a wonder. But this is only one of many similar marvels that have been produced in the age-long struggle for existence through which the countless generations of insect life have passed. The purpose of the odor is doubtless to protect the Lace-wing from the attacks of birds and other enemies.

The Lace-wings belong to the family Chrysopidæ of the order Neuroptera. Most of the species are placed in the single genus *Chrysopa*. The stages of *C. oculata* are illustrated in the accompanying figure, for the loan of which we are indebted to the Cornell University Experiment Station.